

MSME chemical unit invests Rs 9 lakhs in energy efficiency measures—and saves Rs 5 lakhs every year!

Background

Ankleshwar is a chemical cluster in Gujarat. It has over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments—67%; pharma and pharma intermediates—27%; and pesticides and chlor-alkalis—6%). The production capacity of these units varies from 50 tonnes to over 10,000 tonnes per annum (tpa).

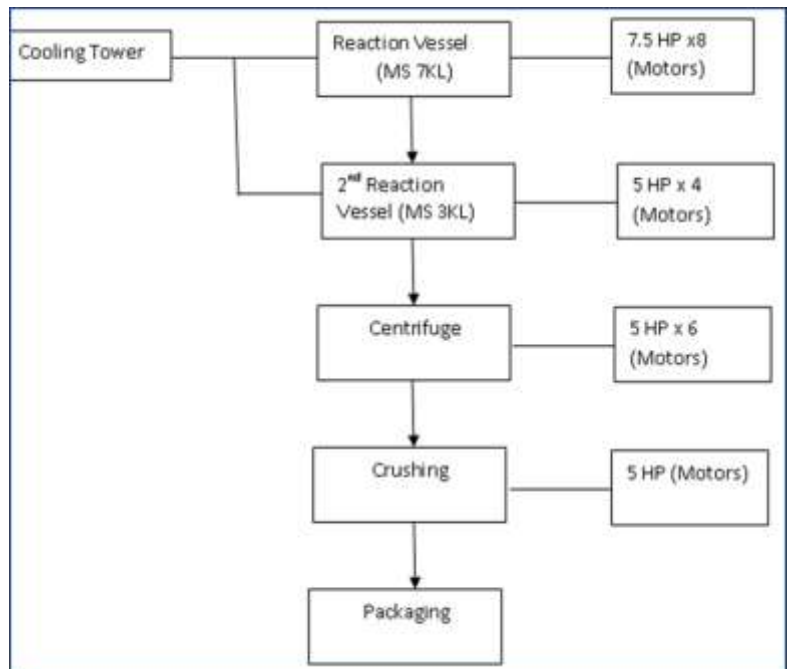
Unit profile

M/s A21 is an MSME unit manufacturing tablets and capsules of sulphamic acid and related compounds. The annual production is about 3600 tonnes. The total annual energy bill of the unit was about INR 28 lakhs, which was around 3% of total turnover. The total annual energy consumption was about 42 tonnes of oil equivalent (toe), of which grid electricity accounted for 72% (30 toe) and natural gas (NG) 28% (12 toe).

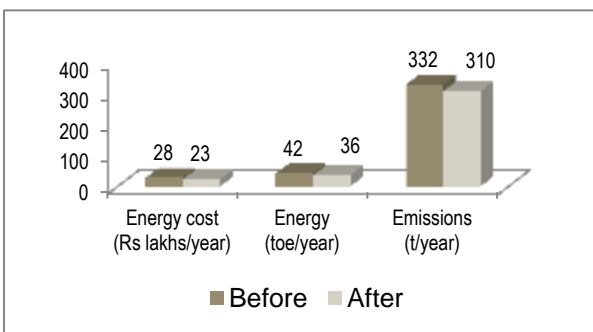
Process description

The manufacturing process involves reaction of the raw materials at a particular temperature, which is maintained through indirect heating by steam from an NG-fired boiler, or cooling by chilled water from a cooling tower. The reaction products are centrifuged and powdered to be processed to the final products.

The main energy consuming equipments used were an NG-fired steam boiler with capacity of 600 kg/hour; an NG-based rotary dryer; electrical motors associated with agitator, cooling tower pumps, and other utilities; and lighting.



Overall Impact: post- implementation



Overall Impact
 19% reduction in total energy bill (i.e. annual savings of INR 5 lakhs) with a simple payback of 1.8 years

This case study has been prepared under WB GEF Project titled “Financing Energy Efficiency at MSMEs in India”. The project aims to identify, design & implement Energy Efficiency (EE) solutions in 500 MSMEs in 5 clusters with potential of EE investment of more than Rs. 100 crore and reduction in GHG emissions equivalent to 1.2 million tonne CO₂. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency (BEE).

INTERVENTIONS

Replacement of damaged wooden cooling tower with an efficient cooling tower

Baseline Scenario

The unit was using a locally fabricated wooden cooling tower of average capacity 25 TR. Its effectiveness was low (about 11%) due to broken wooden fins, resulting in increased cooling cycle time/batch time.



Recommendation

The unit was advised to replace the existing cooling tower with a new natural draft cooling tower of 100 TR capacity.

Implemented Scenario

As advised, the unit replaced the existing cooling tower with a new cooling tower of 100 TR capacity.



This investment of INR 1 lakh is saving 7416 kWh of electricity annually, equivalent to INR 0.5 lakh. The simple payback period is 2 years.

Replacement of cooling tower pump

The operating efficiency of the cooling tower water circulation pump was very low at 13%. As advised, the unit replaced it with an energy efficient pump of the same specifications. This investment of INR 0.21 lakh is saving 5990 kWh of electricity annually, equivalent to INR 0.4 lakh. The simple payback period is 0.5 year.

Replacement of existing vertical type boiler with energy efficient horizontal boiler

The unit was running an NG-fired vertical boiler of 600 kg/hour capacity. Its efficiency was low (69%) due to surface losses and dry flue gas losses. As advised, the unit replaced it with a 3-pass horizontal SIB-type boiler. This investment of INR 7.9 lakhs is saving 10,559 SCM of NG annually, equivalent to INR 3.9 lakhs. The simple payback period is 2 years.

Insulation of rotary dryer and hot air generator system

The surface temperatures of the rotary dryer were found to be high, indicating energy losses due to poor insulation. As advised, the unit applied appropriate insulation on the rotary dryer surfaces. This investment of INR 0.2 lakh is saving 1398 SCM of NG annually, equivalent to INR 0.5 lakh. The simple payback period is less than six months.

Support provided under the project

- Walk-through & Detailed energy audit
- Identification of energy efficiency interventions in the unit
- Finalization of specifications for the energy efficiency interventions
- Identification of technology providers/vendors
- Facilitation for interactions between unit and technology providers;
- Technical support during commissioning
- Monitoring & Verification

Disclaimer: This case study has been compiled by TERI on behalf of SIDBI under WB-GEF Project. While every effort has been made to avoid any mistakes or omissions, these agencies will not be in any way liable for any inadvertent mistakes/omissions in the publication.

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